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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,223	03/10/2004	Nicholas James Adams	TS5581 (US)	4123

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EXAMINER	
SINGH, PREM C	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
05/10/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,223	ADAMS, NICHOLAS JAMES	
	Examiner	Art Unit	
	PREM C. SINGH	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendment to claims 1-8 is noted.

2. New ground of rejection necessitated by amendment to claims follows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Ballegoy et al (WO 00/29511) ("Ballegoy") in view of Chen et al (Molecular Transport

and Reaction in Zeolites, Table 2.1, page 11, John Wiley and Sons, 1994) ("Chen") and evidenced by Young (US Patent 3,864,282) ("Young").

5. With respect to claim 1, Ballegoy invention discloses a process for catalytic dewaxing (See title). Ballegoy discloses, "The invention relates to a process for the catalytic dewaxing of a hydrocarbon feed comprising waxy molecules by contacting the hydrocarbon feed under catalytic dewaxing conditions with a catalyst composition comprising metallosilicate crystallites, a binder, and a hydrogenation component." (Page 1, lines 1-6). "The most preferred binder is silica." (Page 6, lines 12-13). Ballegoy further discloses that the feed comprises slack wax (See page 3, lines 27-33). Ballegoy also discloses that the hydrogenation component is platinum in a range of 0.1 to 5% by weight (See page 6, lines 14-34) and the zeolite crystallites have an average crystal size smaller than 0.2 micron (See page 12, lines 8-9; page 33, lines 30-31). Ballegoy discloses that the weight ratio of the metallosilicate crystallites and the binder is between 5:95 and 35:65 (See page 5, lines 20-21). Ballegoy further adds, "More preferably the zeolite crystallites have a constraint index of between 2 and 12." (Page 8, lines 3-4). Ballegoy also discloses, "The cut point(s) of the distillate fractions is/are selected such that each product distillate recovered has the desired properties for its envisaged application. For lubricating base oils, the cut point will normally be a least 280^{o}C and will normally not exceed 400^{o}C, the exact cut point being determined by the desired product properties, such as volatility, viscosity, viscosity index, and pour point." (Page 17, lines 14-21).

Although Ballegoy invention does not appear to specifically disclose how average crystal size was determined, it would have been obvious to one skilled in the art at the time of invention to use any standard technique, including XRD line broadening technique as claimed, because any standard analytical technique is expected to be equally effective. It is evidenced by Young which is drawn to a process of producing zeolites with very small crystal sizes (See abstract). Young discloses measuring the zeolite crystal size by broadening of the XRD line (See column 4, lines 50-52).

Ballegoy invention uses MTW-type crystallites like ZSM-12 (See page 7, lines 25-28) but does not appear to specifically disclose pores consisting of 12 oxygen atoms.

Ballegoy invention does not appear to specifically disclose that the gas oil yield is higher than the lower boiling fraction.

Chen reference discloses in Table 2.1 that MTW crystallites have channel size 12. This indicates that the MTW disclosed by Ballegoy will also inherently have channel size 12.

Since Ballegoy invention discloses that the exact cut point of the distillates is determined by the desired product properties and the lubricating base oil has a boiling range of 280^{o}C to 400^{o}C and also since Ballegoy invention uses a feed with a boiling range of 202 to 587^{o}C (Page 28, Table IX), it would have been obvious to one skilled in the art at the time the invention was made to modify Ballegoy invention and cut a gas oil fraction such that the yield of gas oil is in a range including as claimed, because gas oil is a more value-added product as compared to the lighter components.

6. With respect to claims 2-4, Ballegoy invention uses slack wax (See page 3, lines 27-33) and discloses, "The hydrocarbon oils to be used as feed in the process according to the present invention will thus contain waxy molecules…… The feed will suitably contain between about 1% and up to 100% of these waxy compounds." (Page 2, line 34 to page 3, line 5). Although Ballegoy does not appear to specifically disclose foots oil, it is expected that the feed used by Ballegoy encompasses it.

7. With respect to claim 5, Ballegoy invention discloses in Table I (Page 18) nitrogen content of hydrocracked waxy raffinate feed to be less than 1 ppmw.

8. With respect to claims 6-8, Ballegoy invention discloses using MTW type zeolite crystallites (See page 7, lines 25-26) and further discloses, "More preferably the zeolite crystallites have a constraint index of between 2 and 12." (Page 8, lines 3-4) and average crystallite size between 0.05 and 0.2 μm (See page 33, lines 30-31).

9. With respect to claim 9, Ballegoy invention discloses, "The weight ratio of the metallosilicate crystallites and the binder is between 5:95 and 35:65." (Page 2, lines 2-3).

Response to Arguments

10. Applicant's arguments filed 03/12/2010 have been fully considered but they are not persuasive.

11. In the arguments on page 6-7, the Applicant argues that there is no mention in Ballegoy of gas oils or of a desire to produce gas oils, and certainly no teaching of how to produce a gas oil fraction in a yield of at least 20 wt%, with the gas oil fraction being larger than the product effluent boiling below the gas oil fraction. Both of the underlined features are recited as limitations in the amended claims. The Ballegoy reference contains thirteen examples and three comparative experiments. The yields and properties of the lubricating base oil products obtained in these examples and comparative experiments are shown in Tables. None of these examples or comparative experiments shows the production of gas oils in high yields of at least 20 wt%.

The Applicant's argument is not persuasive because Ballegoy discloses, "The effluent from the catalytic dewaxing process or optionally the effluent of a hydrofinishing treatment applied subsequently is separated into a gaseous fraction and a liquid fraction. Such separation or fractionation can be attained by conventional methods, such as by distillation ……..The cut points of the distillate fractions are selected such that each product distillate recovered has the desired properties for its envisaged application" (Page 17, lines 6-17). Ballegoy invention uses a feed with a boiling range of 202 to 587^{o}C and 50% boiling point of 417^{o}C (See page 28, Table IX). This indicates

that the yield of a product in the gas oil boiling range is expected to be in a range as claimed.

12. In the arguments on page 7, the Applicant argues that Ballegoy contains inconsistent teachings regarding average crystal size. On page 12, lines 1-4, Ballegoy discloses that "Preferably crystallites smaller than 10 microns and more preferably smaller than 1 micron are used. The practical lower limit is suitably 0.1 micron." On page 12, lines 8-9, Ballegoy discloses that: "Preferable catalysts are used having a crystallite size between 0.05 and 0.2 μm." This latter disclosure is in conflict with the earlier disclosure which taught the lower practical limit of the crystallites size is 0.1. The subsequently disclosed range of between 0.05 and 0.2 μm includes values less than the stated lower practical limit. Based on these conflicting teachings, one skilled in art would be discouraged from using crystallites having average crystal sizes at the lower end of the stated range.

The Applicant's argument is not persuasive because the Applicant cites, "The average crystal size of the zeolite is preferably smaller than 0.5 μm and more preferably smaller than 0.1 μm" (Applicant's Specification, page 6, lines 12-14). The Applicant also cites, "The average crystallite size ……was 0.05 μm)" (Applicant's Specification, page 11, lines 15-17). Therefore, Ballegoy's disclosure is consistent with the Applicant's disclosure.

13. In the arguments on page 7-8, the Applicant argues that the significant point is that Ballegoy contains no teaching or suggestion that a MTW type zeolite having a very small crystallite size, i.e., below 0.1 μm, significantly and unexpectedly increases gas oil yields as discovered by Applicant. In the only specific examples in Ballegoy in which a MTW type zeolite was used (Examples 2a, 2b and 2c), Ballegoy employed zeolites having a crystal size of 0.1 or greater and did not produce any significant amounts of gas oil. The Applicant cites Table II showing that Ballegoy could produce only 6.1 wt%, 5.4 wt% and 14 wt% gas oil in Examples 2a, 2b and 2c respectively, less than 20 wt% as claimed.

The Applicant's argument is not persuasive because in the cited example, Ballegoy uses MTW zeolite with crystallite size greater than 0.1 μm (See page 19, lines 15-18). Ballegoy also discloses, "Preferably catalysts are used having a crystallite size of between 0.05 and 0.2 μm" (page 12, lines8-9; see page 33, claim 20). This indicates that by using a catalyst with crystallite size of 0.05 μm, Ballegoy should necessarily achieve an identical product distribution as claimed. It is to be noted that Ballegoy uses a feed, catalyst and operating conditions as claimed by the Applicant and therefore, the gas oil yield obtained in the Ballegoy process is expected to be in the claimed range.

14. In the arguments on page 9-10, the Applicant argues that the Examples in Ballegoy do not inherently produce gas oils in high yields of at least 20 wt%, nor does Ballegoy teach or suggest how gas oils yields of at least 20 wt% can be achieved. The disclosure on page 17, lines 14-21, regarding cutting points does not teach someone

skilled in the art how to produce gas oils in high yields. These yields of lubricating base oil, gas oil and other end products are determined by the catalyst used and the process conditions. Selecting cutting points only allows one to recover the amount of end products produced in each particular distillation range. It does allow you to increase the amount of product produced in a particular boiling range. Therefore, amended claim 1, which includes the limitation of a high gas oil yield of at least 20 wt%, is not obvious over Ballegoy, alone or in combination with Chen or Young (emphasis added by the examiner).

The Applicant's argument is not persuasive because as discussed earlier, Ballegoy discloses, "The cut point(s) of the distillate fractions is/are selected such that each product distillate recovered has the desired properties for its envisaged application. For lubricating base oils, the cut point will normally be a least 280°C and will normally not exceed 400°C, the exact cut point being determined by the desired product properties, such as volatility, viscosity, viscosity index, and pour point." (Page 17, lines 14-21). Ballegoy also discloses using different feeds with boiling range of 334 to 538°C (See page 18, Table I); 366 to 587°C (See page 22, Table IV); 290 to 701°C (See page 27, Table VII) and 202 to 587°C (See page 28, Table IX). Starting with the feed having boiling range of 202 to 587°C with 50% boiling point of 417°C (See page 28, Table IX) and assuming Applicant's standard with lubricating base oil boiling range of 390°C+ and gas oil with a boiling range of 220-390°C (See Applicant's specification, page 13, Table 2), Ballegoy clearly produces a product in a boiling range of 220-390°C slightly less than 50%. It is to be noted that the Applicant's statement, "Selecting cutting points only

allows one to recover the amount of end products produced in each particular distillation range. It does allow you to increase the amount of product produced in a particular boiling range" clearly indicates that the amount of gas oil and lubricating base oil can be adjusted based on cut points. In other words, Ballegoy achieves gas oil yield in the claimed range.

15. In the arguments on page 10, the Applicant argues that claims 2-9, either directly or indirectly, depend on claim 1 and therefore contain all of the limitations of claim 1, or narrower limitations. These limitations include use of a slack wax or foots oil feed; the use of a MTW type zeolite crystallites having an average crystallite size of smaller than 0.1 and a constraint index larger than 1.0; and yielding a product effluent comprising a base oil fraction and a gas oil fraction wherein the yield of the gas oil fraction is at least 20 wt%, and is larger than the fraction of the product effluent boiling below the gas oil fraction. Since none of the references teach or reasonably suggest the aforementioned combination of limitations, especially the production of a gas oil fraction in a high yield of at least 20 wt%, claims 2 to 9 are patentable for the same reasons as discussed above in connection with claim 1.

The Applicant's argument is not persuasive because Ballegoy discloses use of slack wax (See page 3, lines 27-33); use of MTW type zeolite with average crystallite size smaller than 0.1 μm (See page 7, lines 25-26; page 12, lines 8-9); constraint index larger than 1.0 (See page 8, lines 3-4); and yielding a base oil. Although Ballegoy does not appear to specifically disclose gas oil yield, the feed used in Table IX (See page 28)

clearly indicates about 50% yield of a product with boiling range of 202 to 417°C. This further indicates that the yield of a product cut at 390°C end point (gas oil) is expected to be in the claimed range.

16. In conclusion, the claimed invention is *prima facie* obvious over Ballegoy in view of Chen and evidenced by Young.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PREM C. SINGH whose telephone number is (571)272-6381. The examiner can normally be reached on 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS 050610

/Glenn A Caldarola/
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